

FG-13**Lidar observations of fine-scale atmospheric gravity waves in the nocturnal boundary layer above an orchard canopy**Elizabeth R. Jachens¹, Tyson N. Randall², Shane D. Mayor³

The Raman-shifted Eye-safe Aerosol Lidar (REAL), currently located at Chico State University, observed fifty-two episodes of micrometeorological gravity wave activity in the Canopy Horizontal Array Turbulence Study (CHATS) near Dixon, California in 2007. The REAL provides two-dimensional spatial images of aerosol backscatter intensity often revealing coherent flow structures such as plumes and gravity waves. The waves, with wavelengths ranging from 40 m to 100 m, appear in horizontal cross-sectional elastic backscatter images of the atmospheric roughness sublayer between 10 m and 30 m above ground level. All of the episodes occur at night when the atmosphere tends toward stability. Time-series data from in situ sensors mounted to a tower that intersected the REAL scans at 1.6 km range reveal oscillations in all three wind velocity components and in some cases the temperature and relative humidity traces. We hypothesize that the REAL can reveal these waves because of the existence of vertical gradients of aerosol backscatter and the oscillating vertical component of air motion in the wave train that displace the backscatter gradients vertically.

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